

**DEPARTMENT OF TRANSPORTATION**  
**ENGINEERING SERVICE CENTER**  
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## **METHOD OF TEST FOR EVALUATING COLOR BY MEANS OF CHROMATICITY COORDINATES**

**CAUTION:** Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "**SAFETY AND HEALTH**" in Section I of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

### **A. SCOPE**

This test method is used to determine the spectral characteristics of light-reflecting materials. It is also used to designate their color by the tristimulus values and chromaticity coordinates determined from testing.

### **B. APPARATUS**

1. The testing device shall conform to requirements described in ASTM Designations: E 1164 or E 1347, provided the instrument is capable of satisfying the geometrical and illumination source requirements specified for the material to be tested.
2. Chromaticity charts for purity and dominant wavelength are required as shown in Chapter VIII of the Massachusetts Institute of Technology Handbook of Colorimetry. Other sources of these chromaticity charts may also be suitable.

### **C. STANDARDS AND CALIBRATION**

Standards, usually porcelainized tiles or other permanent material, are normally supplied by the instrument manufacturer.

They should be directly traceable to master standards at the National Institute for Standards and Technology. Calibrate the instrument according to the manufacturer's instructions.

### **D. TEST PROCEDURE**

Following instrument calibration and standardization according to the manufacturer's instructions, determine the chromaticity coordinates and other colorimetric parameters that may be required.

### **E. PRECAUTIONS**

Care should be taken to keep calibrated standards and samples clean, free from contact with abrasive materials, and from surface damage.

### **F. PLOTTING THE VALUE OF THE CHROMATICITY COORDINATES**

The dominant wavelength and percentage purity are determined by plotting the values of chromaticity coordinates,  $x$  and  $y$ , of the sample, on a chromaticity chart complied according to the 1931 CIE Standard Observer and Coordinate System. The exact location of the point of intersection is plotted on this

chart which contains lines of constant dominant wavelength radiating from a point whose coordinates are the trichromatic coefficients of Illuminant C. It also contains contour lines of excitation purity. In this way, the dominant wavelength and excitation purity may be interpolated directly from the chart.

## **I. SAFETY AND HEALTH**

This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices

and determine the applicability of regulatory limitations prior to use.

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. Users of this method do so at their own risk.

## **REFERENCES:**

**ASTM Designations: E 1164 and E 1347**  
**1931 CIE Standard Observer and**  
**Coordinate System**  
**Massachusetts Institute of Technology**  
**Handbook of Colorimetry, Chapter VIII.**

**End of Text (California Test 660 contains 2 pages)**